[illegible]

I trust it will, in electing me you have meant to stimulate the importance of systematic technical training for the maintenance of the status and dignity of what it is,-as I will endeavour to show,- an ancient, very honourable and learned profession, by getting to which [illegible] genius and talents have been entitled to [illegible] those results most beneficial to the interests of mankind. The [illegible] of my address will therefore be centered round the [illegible] ------ [illegible] natural duty, and in [illegible] national asset"-

Let me remind you, in the first instance, that our --- Association, started in 1[illegible], is, so far as I am aware, the first

first institution in India to be formed for promoting professional knowledge and research, and encouraging mutual Cooperation and unity among the sincere Engineers. Prior to that date, there existed only the Civil Engineers' Association for Indian Services in India, to which I had the honour to belong in my time. That body mainly concerned itself with the service problems and interests [illegible]. [illegible] formed in Bombay and Punjab, it fell to the lot of [illegible] to take the lead, and -- start an Engineers' Association for professional ends.

The Bombay and Punjab Engineering Congress, the Burma Society and the Indian institutions were formed much later than ours. We have our circulating library; but they have not. We have our --- Bulletin; they have yet to have an organ of their own-

An Engineers' Institute for all India is now on the topic,

to fi[illegible] to be the upper [illegible].

At this time I am not sorry that we are able unitedly to [illegible] which have always actuated our Government to take that lead in [illegible] to the welfare of the people

the deliberations of our Government, not only for the progress of [illegible] since, but [illegible] spring from people's confidence and trust in [illegible], the [illegible] of high standards called to [illegible], [illegible] , discerns and --- [illegible] [illegible] [illegible] and political [illegible] provide the [illegible] of [illegible]. Over-throw [illegible] and [illegible] the [illegible] [illegible] [illegible]: the [illegible] and the leader-ship displayed by our [illegible].

[illegible] by 40 [illegible],- of [illegible] [illegible] [illegible] which, the political [illegible] storm of [illegible] that -- [illegible] the country,- the people had [illegible] of [illegible] of Government, viz., that its strength lay in people's confidence, its glory in people's virtue, its power in people's contentment, and its success in people's prosperity,- [illegible] --- visualising genius for the [illegible] of the [illegible] tutional Government,- John Stuart Mill,- is [illegible] truth of that key test-belief,- our Hyderabad Government conferred the Representative Assembly upon the people, which it is still the expectant right of outside India to obtain. The spell of John Stuart's teachings had proved its not everywhere in India at that time. But it was only on the inspired and awakened soil of Hyderabad that it bore fruit. The outside India, as we see, has had to wait, till the world-war was over, and the lessons derived

[illegible] [illegible] [illegible] [

installed, [illegible] with Lushington-Hill institute an success. The [illegible] of the genre "Ingram" and French nurse to the [illegible] -- wealth and [illegible], and created the ambition of the rest of -- India which are, however, far from realisation.

What again, the Indore Government,- not content with the ordinary assertion that its function and responsibilities [illegible] completed in affording security of life and property to its subjects, collecting taxes and administering justice,- early saw with the prophetic vision of ancient statesmen that his profits do not depend upon increasing the price of limited wants, but on ---- augmenting the out-put and selling cheap. So the Government realised that its power and greatness depended not on securing protection of life and property alone, ~~but in making~~ life truly noble and great and increasing the wealth and property of its subjects. They ---

They initiated that far-reaching policy of education and there [illegible] of promoting the industrial development of the State,- which is the watchword of every Indore-[illegible] Indore- Elsewhere the people have to wait till the economic distress, and the tilting of the social equilibrium resulting from the want [illegible] by [illegible], which [illegible] and the [illegible], and then even the goal appears as a mere speck in the dim [illegible] of the distant future-

Not the least of these beneficent acts to our own Association, the existence and status of which we owe to the encouragement, --- financial help, [illegible] support of Government-

Government have done their part nobly. It rightly rests with you, Engineers of Indore, to make full use of the opportunities, to perfect your education and training, to make your life's work

[illegible] contribute to the promotion of welfare and prosperity of the people, and to worthily maintain your reputation in face of the strenuous and increasing competition of our rivals in the civilized countries of Europe and America.

The profession requires more education, theoretical and practical and more training of the mind than the profession of an Engineer; for an engineer is who must be prepared for his life's work, ---- involving prolonged and expensive study. He must maintain the best traditions of the profession and high standards of conduct and --- ability.

In every existence of society as now constituted depends, for the most part, on the work of the engineer. He is more and more

more concerned with complex, large and commercial problems of much intricacy, and must be prepared to meet them of welfare and of the education on sound footing.

In a word, the engineer must be prepared for service in all the destinies of the State. To conclude the subject of the engineers' education, I may be permitted to quote the words of Darby. "In industry success goes usually to, not competition here & there, the enemy are teased, one by one, in the grey; and he who can best avail himself of this rule in the end will come uppermost in the struggle for existence". These words are not less true of the engineering profession.

The most difficult part of the young engineer's education is the transition stage between general training and full capability

ca[illegible]bility [illegible] practical expert. Years of actual experiment on combination and practical work, with full freedom, energy and perseverance, will [illegible]ve him that restful knowledge and -- skill of Engineer,- of whom it is told that "he is,"in most one of instrument of civilization and progress which exists, because,with it him, there would be no railways, no steamships, no telegraphs or ---- telephones, no electric power to be distributed free to everybody, no letters or peter reads,- with which latter, however, he has not been able to furnish us yet with satisfaction-

By the bye, it all sounds very nice, and we may congratulate each other on the profession to which we have [illegible] -- pleasant to feel ourselves as very superior beings, [illegible] -- earning our daily bread, we also confer benefit upon others. All this, however, is by way of encouraging us and keeping us up to the

- .. -

the mark- We have no right to assume that, had there been no railways and motor cars, no telephones and telegraphs,- the world would have been a what less civilized, less moral and less happy then it is-

It is never safe to talk of "what might have been", nor is it justifiable to assume that the Engineer is the salt of the --- earth". By some hook or crook, the Engineer has risen in the past and has played his tricks. And the world has chosen, for the --- present, that she will go by his tricks- speaking for myself, I dare say that this, the world's choice, is an unwise one. I confess I should like to spend it in town with you in settling before you a physician world, in which there would be no Engineers, but -- all Metaphysicians- That, however, would be obviously unjustifiable

[illegible] for the recent occasion. [illegible] by the engineer's art for our use of any kind, while engineers are the [illegible] and [illegible] of that art.

Engineers, therefore, because of the nature of their work and its relation to the lines of modern development, stand in close relationship to the world's activities, to commerce, and to social life. They bring them into contact with many branches of physical science- His thought and action influence Art, interfere with nature, and even resort on Life's by-

As regards science, it is not so much claimed that Engineering is a science by itself, that all scientific truths, laws and principles [illegible] the basis of Engineering. But that is the case, Engineering becomes truly scientific,- and none the less --------

It, scientific, because it [illegible] engineer's [illegible]

It has been, no doubt, a matter of regret to some men like myself that, as years roll on, and experience accumulates, one's work comes more and more to deal with out of the way, matters of business and practical considerations, &c., and less with technical and scientific problems of Engineering- But when we look back over the scientific questions answered, we look back upon the very essence and joy of our careers- If an Engineer has, by scientific means, put on a scientific spirit and handled his task, and met with them, records of their [illegible] and estimated their effect upon the results, finally took his bearings and set upon it, then, I say, he is acting as truly as a man of science.

The scientific engineer may use elaborate calculations, or he may not - A most important part of his science lies in judging whether to use them or not-

The Engineer of all men should have the earliest opportunity of working himself free from stereo-typed methods, and should know that there are half-a-dozen ways of doing a thing, and that the -- half-dozen ways are more or less equally good.

The more we see of Engineering works, the better we know --- that none of our problems have one single solution, that all of -- them can be worked out to the same end in many different ways, and that it very seldom happens that any one method is so much better than the others, that it can be called the first method. If such is our experience, ought we not be entitled to set an example for tolerance and broad-mindedness-

An Engineer,must, to a certain extent, be an Artist; and if he is not gifted with natural powers to be his own artist, ---- must not hesitate to take the help of an artist, to give proper finish to his work. In this connection, I quote from an unknown writer,- "Makers of Engines (I may say an Engineer for the present

purpose) generally rely on this detail,- as ladies do on their --- bonnets,- namely on the useful and ornamental conclusion of the paraphernalia of one whole, in which both parties delight to ----- indulge".

It would not be inappropriate to say something of the --- relation of Engineers and Engineering to nature-- There are two -- schools of critics-- According to one, we are sometimes guilty of disfiguring Nature; according to the other, we adorn Nature- As long as we have the pairs of opposites in the world,- up and down, light and shade, front and obverse,- both criticisms will prevail- The conversion of valley bottoms into lakes is not an eyesore, and does no harm to Nature- The Alpine Railways,- like the Simplon and St.Gothard,- rather add interest to the landscape than disfigure it- There may be some mountain towers or Railways or ----- ruined huts, which excite resentment in the lover of landscape, but how far such a ~~verdict is not~~ due to the modern tourist's ---

omniscient "fad",- it is difficult to judge-

Our very close connection with the profession of Law, it is needless for me to expatiate. It is necessary for the ---- Engineer to carry out his work in the most strictly legal spirit- All engineering work is carried on according to a specification and a contract- The specification should be carefully drawn up: the requirements should be exactly stated, and endeavours should be made to look at it from the contractor's point of view. No loophole should be left, and no room should be given for doubt, or ambiguity, or uncertainty in the words and phrases employed- The Engineer must say just what he wants, and no more and no less than what he intends to have-

The characteristics of a good specification are definiteness and clearness always, fulness as to requirements, and as to guarantees, and freedom and openness as to details and methods,-

Every Engineer stands in very close relationship with ordinary commercial and social life,- the manufacturer, the tradesmen, the merchant, the contractor, and the industrial public- My one advice is that we can never go wrong,-never, any of us,- if we only take our motto that,- as to our work, whether construction work, or project work, or account work, or brain work, or paper work,- its quality is the first and only consideration,- and that money-getting is no consideration, it is not obtained as gentlemen.- I ask the Members of this Association to keep before them for their own sakes, as well as for the honour of the Institution, an ideal of conduct and integrity,- which will be an ideal for the noblest profession in the world.-

In the most subtle matter connected with the business side of our Engineering life,- to wit, the relations between the two great sections of Engineering,-namely, the Engineers and the Executive subordinates and contractors, the relationship must be most honourable,- beyond people's talk,-above reproach, just like the "Caesar's wife"-

Engineers must, on all occasions, keep what one Engineer has felicitously remarked, "keep out of the unstable whirlpool of ---- "politics", as he keeps his bridges and weirs out of the dangerous pools. It would be unwise and unphilosophic for us to be too indignant or too angry, or too virtuous, on matters which do not --- directly concern us-

So far, for the education, training, qualifications, and conduct of an Engineer-

If you will now patiently bear with me,- let me tell you --- that Engineering art is as old as Creation itself- Believing in the Darwinian theory of evolution,- the gradual transformation and development from the Primordial other,- that formless voidless and invisible essence,- into tangible matter and gross elements: and in succession, into numerous suns, stars and planets,- and, coming into our own planet, into endless forms of inorganic matter, ------

cultinating into the subtle varieties of highly organised plant and animal life,- all this is a sheer manifestation of immanent Engineering energy.-

When a bird builds his nest,- or a bee its hive,- or the ferocious tiger turns a mountain crevice into comely den,- there is the first attempt of an organised Engineering- The rapidity and the stages through which the savage man emerges from his state of savagery to semi-barbarism, and then to civilisation, are measured by the rapidity and the stages of his Engineering skill.

The ancient nations of mankind,- the Babylonians, the Egyptians the Phoenecians; and the Greeks and Romans of later times, have signalised their triumph in civilisation by bequeathing to the world rare works of their Engineering Art and monuments of their Engineering skill- These ancient relics can hardly be surpassed by any that the Engineer has accomplished in modern times- True, we have our railways, our wonderful structures of steel, and -----

applications of steam and electric power,- which they had not- but their magnificent buildings and temples, monuments and ----- towers.- their perfect style, beauty and harmony,- baffle our imagination, and are still worthy objects for our imitation only, not objects which we have acheived or surpassed-

The splendour and wealth of those Ancient Nations,- their law and polity, their music and dancing, their games and enjoyments, have been for ever irretrievably lost and forgotten; but the monument of their Engineers' skill alone,- as witnessed in the ruins of Thebes and Nineveh, the Pyramids of Egypt, and the Sphinx, and the ruins of Pompeii,- live as testimony to the ---- history and civilisation of those peoples. Similarly, the ---- excavated discoveries of the Engineering Art in the far-off, unsuspected regions like Mexico, South America, and Mid-Africa, point to the existence and history of Nations, which History has never heard of, or dreamt of their existence-

In going through an old city, or studying an ancient building, you get a much more vivid picture of the History and civilisation of the peoples who built it than from a life-long study of their literature and poetry- You gentlemen, who have visited the ancient Roman towns and remnants of Roman ditches and walls in England,- who have visited the Capital and the Colosseum in Rome,- the old Roman temple still existing with its alters of worship where the Caeser officiated as the "Pontifices Maximus' in religious sacri-fices,- their will bear testimony with what pertinacity the ----- Engineer's handiwork clings and survives to be the ancient historian,- when all other histories are apt to be forgotton or lost altogether-

Not inaptly, therefore, the old time-honoured cult of ----- Free Masonry, I hope I am not betraying the pledged secrets of that order,- have adored the great God, the Creator of the Universe, as the Great Geometrician and Architect- Mark that the Freemasons ---

have placed Creation, Mathematics, and Engineering on the same high pedestal: and have drawn the symbols and formulae for their worship from the symbols and tools of the Engineering Art-

In our country of Hindustan, the Architect has successfully translated the annals and treasures of traditional lore and mythological beliefs, sacred to the religion of the Hindus, into imperishable record of stone carvings and sculpture that adorn the temples spread broad-cast over the whole peninsula.

Nor are the Mahommedan Engineers less vigilant in that respect-

The grandson of the Great Akbar, Emperor Jehan Shah, (or Shah Jehan as he is generally called), than whom no more magnanimous King sat on the peacock throne of Delhi,- strove to outshine his beneficient rule, his wise statesmanship, and his love of the people,- by handing to the posterity, the feats of the engineering skill which reached the zenith of its greatness ----

during his reign- He raised the celebrated Jumma Masjid of Delhi, built the modern city of Delhi with its six-mile-round wall.- which he fondly called Shah-Jehan-a-bad, but which name never -- adhered to it,- brought the Jamna waters from a distance of 90 miles to the Chandni Chouk of the Imperial City, with the ------ efforts of his,- as we would say now,- Chief Engineer for Irrigation, Ali Maruan Khan,- and several other Engineering works of fame and art- The Engineers, who selflessly did their work of love, have closed their eyes- The Great Mogul is dead- The -- - works will, for long, mark the splendour of the Mogul Empire- towering over all of them, stands the unrival-led Taj Mahal,- the work of Engineer,- the most beautiful tomb in the world ---- raised over the most beautiful queen,- the beloved Mumtaz-e-Mahal built by her loving husband to vindicate his pledge given at the deathbed, that, over her remains, a monument would be raised --- that the world had never seen before-

His father, Emperor Jehangir, who, if he had not ascended the throne of Delhi, would have been a great town-planning and --- Landscape Engineer,- is one whole love of Engineering has outlived his fame as the Mogul Emperor- His memory is cherished much better to this day, as the man who planned the Shalimar gardens of Lahore and the beautiful paradise-like retreats in the Happy Vale of ---- Kashmir, rendered happier by the Jehangir's love-

Now I'll take you briefly through some of the works carried out by the Engineer in Modern times-

From the dawn of history the Engineer has been busy on the banks of the Nile- It is not only in modern times, but from remote ages, that the engineers have carried out great schemes to gain --- control over the waters of mighty rivers- Thus we read that King Menes (whose date is given as 4400 B.C.) made a new channel for the Nile river to save his city of Memphis from destruction by floods- Two thousand years later, another King of Egypt, with an unpronounce-able

name, by enlarging the old canal connecting the Nile with the great Fayoum Depression, created an immense reservoir,- Lake Moeris as it is now called,- with a ,t ,erious water surface of 970 square miles. The regulation of the flow in and out of this vast lake controlled the Nile flood at its highest and ---- lowest-

By the engineers art, it may be truly said that it has --- come to pass "Egypt is the Nile, the Nile is Egypt"-

Nevertheless the Nile would always seem to have demanded its sacrifice. In early days, propitoatory offerings of gold were cast into its turbid waters. And an arabian legend runs that, yearly in ancient times, a virgin, gaily decked as a ---- "Bride of the Nile" was flung into the river to ensure an ----- abundant flood.

In modern times, the problem of holding up water in the

Nile more abundant than it did in the past was one of the most --- difficult problems an Engineer was called upon to solve- I do not propose to enter in the details of achievements and the difficulties overcome- But suffice it to say that, with the completion of five great schemes, crowning what are called "the Improvements of the Nile", viz., the improvement of the Delta Barrage, the erection of the Assuan reservoir, and the construction of new Barrages at Assiout, Zifta and Esneh"- will close one of the most important epochs in the history of the Engineer's achievements-

Gentlemen, do not trouble about their cost, but ask who benefits and how? Of course, to answer this question on plain lines is difficult. We may give some facts and figures, but it is not easy to translate into figures the great services rendered to ---- dwellers in that ancient land by the Engineering accomplishments-

The Assuan Reservoir, and Assiort Barrage alone, it is --- computed, have enabled 5 lakhs of acres to be converted into -----

perennial irrigation, and increased their value by 15 crores of rupees-

The Engineer's energy bestowed upon the Nile proves the --- truth of the saying that industry triumphs over Nature-

Egypt was a granary of the world from the earliest times. To irrigate more land is her destiny. In helping her along it, in aiding her to fulfil her ancient destiny,- Engineers have --- played no mean part and have added to their laurels by the way they have accomplished it-

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Again the Engineer has caused no small amount of consternation and puzzle to the Jurist and Lawyer when what are hitherto treated by the time-honoured usage and law as "immoveable property" has been proved to be "moveable", when he performed one of the most daring and remarkable of feats, known as "House Moving" in the profession.

The bodily uplifting of a brick edifice in Brooklyn,U.S.A., 150 feet in length, 50 in width, and 10,000 tons in weight,- and moving the theatre 50 feet back, swinging round through an angle of 90° and moving forward again 60 feet,- demanded no little Engineering skill-

More stupendous was the removal of a two-storey brick-building near Pittsburg weighing 200 tons, over a distance of 4 miles, most of it being upon water. In this feat, complications upon complications arose. The ground was so soft that the building was in danger

of

of collapse. When the moveable and moving house reached the river bank, a heavy flood arose and surrounded the stranded house. When touring down the river, four low bridges had to be negotiated and the barge had to be scuttled; and then lowered to pass through a lock. At the end of the river journey, the house had to pass three railway tracks at intervals before it could settle down upon its new seat- The successful building of the wireless towers is typical of the dogged perseverence of that scientific genius and marks an unique triumph of engineering skill-

Nor is less skill required in the construction of those finest floating docks, capable of lifting battleships, first class cruisers, and gigantic liners.- The scientific method of dry-docking a ship, as contrasted with the crude kind of dry dock practised by the ancient Phoenician Mariners by floating damaged galleys into a

a natural creek, damming up the entrance and bailing out the water,- marks the pace of the application of science to the Engineering Art. In the story as told of Cleopatra's needle,- that colossal stone obelisk, 200 tons heavy, 70 feet long, quarried near the modern Assouan, 3,500 years ago, floated down the Nile 700 miles, first erected at Heliopolis, where after remaining for over fifteen centuries, it made another journey by the imperial decrees of Augustus Caesar who ordered its removal to Alexandria to adorn the entrance of the gorgeous palace of the Caesars; therein Alexandria again, putting in another period of service of fifteen centuries as watchman at the gates, long after the grand building of the Imperial Caesars had fallen in ruins, then as if by exhaustion from long continued service, "In attention" it fell prosprate, but fortunately unbroken and unharmed; afterwards it passed into the ownership of

of Great Britain when the English army defeated the French at the battle of Alexandria in 1801, within sight of the fallen monument, when it was reserved to the Engineer to carry the monolith to London. After several unsuccessful attempts it was left where it lay, and the Kings of England,- George IV and William IV refused to have anything to do with it. Not till the middle reign of Queen Victoria were definite efforts again made to transport the obelisk to London-

The arduous business of removing the mighty ancient Needle and equipment for the long sea voyage which lay before it, this time fell to the lot of two Civil Engineers, named Dixon and Baker. A long volume may be written on the methods adopted for its transportation, raising above ground, and encasing the obelisk with a water-tight casing and transforming it into a loating ship, difficulties of launching, the breaching of the "Cleopatra" as the

the unique ship was called, before it floated, the commencement of the voyage, the casting-adrift in the Bay of Biscay, the Needle regarded as lost for ever, and subsequently found and final re-erection of the Needle on the Thames Embankment in London-

That history of the transport of Cleopatra's Needle across the open sea from Alexandria to London, and its erection on the Thames Embankment, if written, will be written the history not of a great unique Engineering feat alone, but of the Engineer's love for the sublime, and the Historical, his scientific devices, his resourceful industry and assiduousness, his undaunted courage, his triumph over misfortune, his decision to take no risks, and his cheerful devotion to duty-

No wonder, then that the Engineer and Architect, in his anxiety to provide more houses in the centre of commercial and business actitity,- rather than stretching a town laterally,- have adopted the policy of what I might phrase as the vertical extensions of cities,- by erecting lofty steel frame buildings, colloquially known as the "Sky-Scraper". With brick and stone, the limit is reached with 8 or 10 stories. The thickness of walls reduced the floor space. Why should not an Engineer take advantage of the fact that steel is 200 times stronger than brick work, and incorporate steel work into his edifice-

He obtains far more interior space on a given site, far more rental value for the outlay, greater security against earthquakes, speed in construction, better protection against fire and greater facilities for arranging the interior accommodation and

and decoration. Remarkably lofty towers can be provided with greater ease; lending to purity of architectural treatment and an appearance of dignity combined with fine proportions-

These sky-scrapers rise above the level of city's dust and flies and mosquittoes do not trouble the dwellers in these lofty regions-

It serves as an object lesson of the manner in which Engineers are always ready to attack new problems without regard to conventional practice or time-honoured precedents. The successful nature of the solution found in these lofty sky-reaching buildings, combined with the modern "Express Lift" service has justly entitled the sky-scrapers to be placed among the engineering wonders of the world.

There is nothing in Romance or Ancient History or Mythological Stories that is more thrilling, more soul-inspiring than the work and achievements of the Engineer in the domain of Railway Construction and management. His application of Modern Science to Railway Engineering, and evolution of a thousand and one niceties connected with the locomotives, plate-laying, and ~~x~~ negotiation of the earth's surface for donning the iron girdle, his measures of safety and comfort to the travelling public, his organisation and his precision

have staggered the imagination of man, have revolutionised the social political and moral condition of human society, and have completely transformed life's outlook, its goal and its aspirations-

To attempt to describe in detail the accomplishment of the Railway Engineer would be to attempt to reckon the particles of sand

sand on the seashore, or to count the melecules of water in the great ocean that girdles the earth-

However, I will take a typical case of the Uganda Railway- a study of which is a study of the Engineer's career and his triumph-

The first suggestion for the creation of this line, from Mombassa to Victoria Nyanza, was to provide an effective means of counteracting the Slave Trade in the interior of the Dark Continent of Africa- Surveys were carried out by skilled Engineers, and it was estimated that its cost would not exceed 2½ millions sterling-

As has been the case with many other Engineering works in all parts of the world, the first estimate of the cost of the Uganda Railway was found to fall very short of the mark, the ultimate expenditure being nearly 5½ millions sterling- The length of the

line is some six hundred miles-

Starting from the capital of Mombassa in the island of the same name, it reaches the main land by a handsome Steel trestle bridge, named after Lord Salisbury, Stateaman,- which is an Engineering feat of first magnitude,- supported by some 20 iron piers, sunk deep in the bed of the arm of the Indian Ocean that separates the Mombassa Island from the mainland of African Continent. These piers tower up so high above the High Water Mark as to offer no impediment to the free Navigation of the Sea channel-

After traversing in succession through tropical climate then scrub jungle, water-less desert, into an open hilly country, and again, crossing the Ath plains,- this Railway, which may be described as discovering a corner of the world about which little was known before,- enters the new prosperous town of Nairobi which did not even exist at that time-

Once Nairobi is left behind, commence the real difficulties of this Railway-

Climb towards the hills, that form the back-bone of the African Continent; rushing streams, necessitating heavy bridging and viaduct work,- awkward curves and twists, dense forest, exciting encounters with Lions, scarcity of native labour, who, even when available, "are far more bother than they are worth"-

As it goes forward, it passes through jungle, swamp and desert, up the sides of great mountains, and plunges ever and anon into the darkness of the primeval forest,- It meets with almost every variety of climate imagineable, from the intolerable baking-heat of Mombassa to the frosty highlands which give you chattering teeth, half-frozen fingers, and benumbed feet-

From the Engineering point of view, it is doubtful if a line was ever carried through a more difficult country, or, one worse adopted to Railway construction.

To crown these obstacles and difficulties, as it were, the marauding habits of natives in certain districts, through which the Railway passed, have to be reckoned with. During the nights, they would bolt away with "chains" and "fish plates", which had a special fascination for them. Water difficulties for the locomotive had to be surmounted; and an altogether considerable ingenuity has been displayed by the Engineers in charge of the line in overcoming the scarcity of water that exist along the route-

From whatever point of view the Uganda Railway be contemplated it is one of the most extraordinary lines ever built, and stands as a monument of Engineering skill and enterprise. The ingenuity shown

shown in surmounting the many difficulties encountered was truly remarkable, while the Engineers confronted the dangers of pushing a line of railway through the heart of a virgin and, to a considerable extent, unknown country with dauntless pluck and perseverence . Never once did they falter from the task they had taken in hand, though at tomes they might well have been pardoned had they given way to despair-

To you,- Mysore Engineers and Mysore Gentlemen,- if I were to describe the powerful electric plants- those marvels of capacity, ingenuity and workmanship of the Electrical Engineer,- the generation therewith of that subtle, elusive force now adaptable at the will of man to turn the shafts of great factories at long distances, and light the streets and homes of faraway cities, I would be only "carrying coals to New Castle", for our Sivasamudram in Mysore has been the Mecca of Electrical Engineers in India-

These typical instances, by no means, exhaust the innumerable list of remarkable undertakings of the Engineer. I can only take a bird's eye view of sòme of the rest,- no less conspicuous in their ingenuity, no less far-reaching in their results and benefits they confer upon Society. They are, for instance, sinking of extra-ordinariyly productive Artesian wells,- with bores going, thousands of feet deep and output up to a million of gallons per day,- shot up with violance,- Engineering operations in the world's oilfields, with its intricate oil-field geology, with devices of raising oil to the surface and extinguishing a brunning fountain, processes of di distillation and refining, and with the promise which this industry has given for the conquest of the air,- the underground rails and sub-ways, provided high-capacity, rapid transit so vital to the high-pressure life of modern Metropolli,- the laying of ocean-cables- the colossal tools of machinery,- the equipment of a modern ship-yard

ship-yard the aerial railways,- the Panama Canal,- why and how it is built,- the flying machines, the aeroplanes and aeronautical engines and propellars,- and Harbour works, and the wonderful drainage systems of great cities; and last,- not the least important of these,- the great irrigation works of India-

The most notorious of the Engineer's efforts has been the use of his talents to their fullest extent in waging the war and inventing the modern destructors of human life and property. The late war has been justifiably called the Engineer's war. None the less, we are always, and should be still more, willing that our training and experience might be utilised in prosecuting and furthering the ~~xx~~ acts of peace-

Gentlemen, the theme is long, and time is limited. I have already trenched upon your valuable time a good deal. Once you begin to talk the temptation to take more and more is great. But I must and will now conclude-

It is impossible to deal exhaustively, in a paper of this kind, the intellectual education, the moral character the spiritual joys, and the opportunities of doing good to the Society which the dedication to Engineering Science confer upon man. You acquire all those qualities which, to quote a familiar expression, go to make up the best qualities of head and heart- You develop in yourselves courage, perseverence, self-sacrifice, loftiness of conception, boldness of execution, devotion to duty and performance of work for its own sake. By acting, nobly and well, your part as Engineers, you can best serve your God your conscience, your sovereign, your country, and your fellowmen-

If any portion of what I have said to-day, have succeeded in waking up the high sense of responsibility and noble trust, in seizing the immense opportunities that lie before you, like the innumerable pearls at the bottom of the sea,- which only demand from you a deep-dive into the bottom,- and in making your worthy representatives of your creed, and in establishing the reputation of M.C.E. (Mysore Civil Engineer) as great, if not greater, than M.I.C.E. of London; I shall feel I am amply rewarded-

In concluding, I reverentially beg to thank you for the patient hearing which you have given, and the indulgent spirit with which you have borne with me in my incoherent rambles upon a subject which should have fallen into more capable hands-

I now invoke the best blessings, and wish every success for the present Session of your Association.